IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of Commander et al.
Serial No. 10/091,106
Filed March 5, 2002
For DEFECT REDUCTION IN ELECTRODEPOSITED COPPER FOR SEMICONDUCTOR APPLICATIONS
Group Art Unit - 1753
Examiner Edna Wong

DECLARATION OF RICHARD HURTUBISE

I, Richard Hurtubise, declare and state as follows:

1. I am a co-inventor of the subject matter claimed in the above-noted application and am an employee of the assignee Enthone Inc. Pursuant to the duty of disclosure under 37 CFR 1.56, I make the following statement concerning certain activities involving the subject invention which occurred more than a year prior to the application=s filing date March 5, 2002, i.e., prior to the critical date of March 5, 2001.

2. Prior to March 5, 2001 my co-inventors and I invented an electroplating bath formulation which contained, as a leveler, a compound we designated "Compound 2275." Compound 2275 qualifies as each of the following:

"an aliphatic polyamine compound" (claims 8, 15, 29, 48); and

"a reaction product of benzyl chloride and hydroxyethyl polyethylenimine" (claims 10, 17, 31, and 50).

Compound 2275 was included in electroplating bath compositions which were "beta site tested" at certain customer locations beginning in early December 1999. This beta site testing involved testing of the bath compositions by Enthone personnel at customer locations. The compositions

were not sold during beta site testing and the customers were not advised of the components of the compositions. Beta site testing of compositions including Compound 2275 continued through the end of 2000.

3. Beginning in November 2000, December 2000, or January 2001, some customers in the U.S. and Europe were provided compositions containing Compound 2275 for use in prototype testing (aka "Production Tool" testing), which is the next set of tests for electroplating compositions after beta site testing, both typically and in the present instance. These compositions containing Compound 2275 were sold to the customers for this prototype testing. It is standard practice in the industry that customers pay for the compositions during the prototype testing period because the volumes, though substantially less than used during eventual production, are too great to be given away. During this prototype testing phase customers plated prototype wafers and reported the results to Enthone. Wafer fabricators prototype test new compositions for between about 6 and 24 months before concluding whether the compositions are efficacious for production-scale wafer fabrication, both typically and in the present case. This is reflected in the attached graphic "Production Ramp-up Model and Technology Mode." A large quantity of data based on wafers which have been plated using compositions such as of the invention and have undergone post plating chemical mechanical polishing in a prototype environment is required to determine a) whether the compositions are efficacious for production-scale wafer fabrication, b) whether further refinements are required, and c) specification targets for the compositions.

4. It was not until after March 2001 that we understood the capacity of the compositions of the invention beyond

leveling; that is, it was not until after March 2001 that we understood the capacity of the compositions of the invention to reduce defectivity in wafers. We arrived at this understanding based on information provided to us by customers performing prototype testing. We continued to refine specification targets for the compositions after March 2001.

5. All statements made herein of our knowledge are true and that all statements made on information and belief are believed to be true; and further, these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Richard Hurtubise — 12-21-04

Richard Hurtubise — Date